## WHAT IS CLAIMED IS:

1. A high strength titanium copper alloy consisting of Ti at 2.0% by mass or more to 3.5% by mass or less;

the balance of copper and inevitable impurities; and the average grain size of 20  $\mu$ m or less;

the alloy further comprising a 0.2% proof stress expressed by "b" of 800 N/mm<sup>2</sup> or more; and

a bending radius ratio (bending radius/sheet thickness) not causing cracking as expressed by "a" by a W-bending test in a transverse direction to a rolling direction;

wherein "a" and "b" satisfy  $a \le 0.05xb - 40$ .

2. A high strength titanium copper alloy consisting of Ti at 2.0% by mass or more to 3.5% by mass or less;

at least one of Zn, Cr, Zr, Fe, Ni, Sn, In, Mn, P, and Si at 0.01% by mass or more to 3.0% by mass or less in total; and

the balance of copper and inevitable impurities;

the alloy further comprising an average grain size of 20  $\mu$ m or less; a 0.2% proof stress expressed by "b" of 800 N/mm² or more; and

a bending radius ratio (bending radius/sheet thickness) not causing cracking as expressed by "a" by a W-bending test in a transverse direction to a rolling direction;

wherein "a" and "b" satisfy  $a \le 0.05xb - 40$ .

3. The high strength titanium copper alloy according to claim 1, wherein the average grain size is in a range of 3 to  $20 \mu m$ .

- 4. The high strength titanium copper alloy according to claim 1, wherein the titanium copper alloy is obtained by performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase.
- 5. The high strength titanium copper alloy according to claim 2, wherein the titanium copper alloy is obtained by performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase.
- 6. A manufacturing method for a high strength titanium copper alloy according to claim 1, characterized by performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase.
- 7. A manufacturing method for a high strength titanium copper alloy according to claim 2, characterized by performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase.
- 8. The manufacturing method for a high strength titanium copper alloy according to claim 6;

wherein the alloy is cooled, after final recrystallization annealing, at a cooling rate of 100°C/sec or more;

cold worked at a working ratio of 5 to 70%; and subjected to an aging process for 1 hour or more to 15 hours or less

at a temperature of 300°C or more to 600°C or less.

9. The manufacturing method for a high strength titanium copper alloy according to claim 7;

wherein the alloy is cooled, after final recrystallization annealing, at a cooling rate of 100°C/sec or more;

cold worked at a working ratio of 5 to 70%; and subjected to an aging process for 1 hour or more to 15 hours or less at a temperature of 300°C or more to 600°C or less.

- 10. A terminal connector using a high strength titanium copper alloy according to claim 1.
- 11. A terminal connector using a high strength titanium copper alloy according to claim 2.
- 12. A high strength titanium copper alloy which is subjected to an aging process after press working, the alloy consisting of:

Ti at 2.0% by mass or more to 3.5% by mass or less; and the balance of copper and inevitable impurities; the alloy further comprising a grain size of 5 to 15  $\mu$ m;

wherein cracking does not occur by a W-bending test in a transverse direction to a rolling direction with a bending radius of zero before the aging process, and the hardness of the worked matrix after the aging process is 300 Hv or more.

13. A high strength titanium copper alloy which is subjected to an

aging process after press working, the alloy consisting of:

Ti at 2.0% by mass or more to 3.5% by mass or less;

at least one of Zn, Cr, Zr, Fe, Ni, Sn, In, Mn, P, and Si at 0.01% by mass or more to 3.0% by mass or less in total; and

the balance of copper and inevitable impurities;

the alloy further comprising a grain size of 5 to 15  $\mu$ m;

wherein cracking does not occur by a W-bending test in a transverse direction to a rolling direction with a bending radius of zero before the aging process, and the hardness of the worked matrix after the aging process is 300 Hv or more.

14. A manufacturing method for a high strength titanium copper alloy according to claim 12, comprising the steps of:

performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase to adjust the grain size to 5 to 15  $\mu$ m; and

performing final cold rolling at a working ratio of 5 to 50%.

15. A manufacturing method for a high strength titanium copper alloy according to claim 13, comprising the steps of:

performing final recrystallization annealing at a temperature below a borderline of an  $\alpha$ -phase and an  $\alpha$ +Cu<sub>3</sub>Ti phase to adjust the grain size to 5 to 15  $\mu$ m; and

performing final cold rolling at a working ratio of 5 to 50%.

16. A terminal connector using a high strength titanium copper alloy according to claim 12.

- 17. A terminal connector using a high strength titanium copper alloy according to claim 13.
- 18. A high strength titanium copper alloy consisting of:

  Ti at 2.0% by mass or more to 3.5% by mass or less; and
  the balance of copper and inevitable impurities;
  the alloy further comprising a tensile strength of 1200 MPa or
  more and an electrical conductivity of 10% IACS or more.
- 19. A high strength titanium copper alloy consisting of:

  Ti at 2.0% by mass or more to 3.5% by mass or less;

  Zn at 0.05% by mass or more to 2.0% by mass or less;

  at least one of Cr, Zr, Fe, Ni, Sn, In, Mn, P, and Si at 0.01% by

  mass or more to 3.0% by mass or less in total; and

  the balance of copper and inevitable impurities;

  the alloy further comprising a tensile strength of 1200 MPa or

  more and an electrical conductivity of 10% IACS or more.
- 20. A manufacturing method for a high strength titanium copper alloy according to claim 18, comprising the steps of:

hot rolling at a temperature of 600°C or more; cold rolling successively at a working ratio of 95% or more; and aging at a temperature of 340°C or more to less than 480°C for 1 hour or more to less than 15 hours while maintaining an agglomerated matrix after the cold rolling.

21. A manufacturing method for a high strength titanium copper alloy according to claim 19, comprising the steps of:

hot rolling at a temperature of 600°C or more; cold rolling successively at a working ratio of 95% or more; and aging at a temperature of 340°C or more to less than 480°C for 1 hour or more to less than 15 hours while maintaining an agglomerated matrix after the cold rolling.

- 22. A fork-shaped connector using a high strength titanium copper alloy according to claim 18.
- 23. A fork-shaped connector using a high strength titanium copper alloy according to claim 19.
- 24. A high strength titanium copper alloy which is subjected to an aging process after press working, the alloy consisting of:

Ti at 2.0% by mass or more to 3.5% by mass or less; and the balance of copper and inevitable impurities;

the alloy further comprising a worked matrix having a hardness of 345 Hv or more after the aging process.

25. A high strength titanium copper alloy which is subjected to an aging process after press working, the alloy consisting of:

Ti at 2.0% by mass or more to 3.5% by mass or less; Zn at 0.05% by mass or more to 2.0% by mass or less;

at least one of Cr, Zr, Fe, Ni, Sn, In, Mn, P, and Si at 0.01% by mass or more to 3.0% by mass or less in total; and

the balance of copper and inevitable impurities;
the alloy further comprising a worked matrix having a hardness of
345 Hv or more after the aging process.

26. A manufacturing method for a high strength titanium copper alloy according to claim 24, comprising the steps of:

hot rolling at a temperature of 600°C or more; and cold rolling successively at a working ratio of 95% or more.

27. A manufacturing method for a high strength titanium copper alloy according to claim 25, comprising the steps of:

hot rolling at a temperature of 600°C or more; and cold rolling successively at a working ratio of 95% or more.

- 28. A fork-shaped connector using a high strength titanium copper alloy according to claim 24.
- 29. A fork-shaped connector using a high strength titanium copper alloy according to claim 25.